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TITLE: Porous fuel cell electrode substrate having elongated holes for feeding reactant gases

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INVENTOR-INFORMATION:

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US-CL-CURRENT: 428/188; 428/332, 428/408, 429/34, 429/44

CLAIMS:

What is claimed is:
1. A carbonaceous electrode substrate for a fuel cell, comprising a uniformly porous and carbonaceous material, said electrode substrate having a first flat surface to be in contact with a separator sheet in a stack to form a fuel cell, a second flat surface to be in contact with a catalyst layer and an average bulk density of 0.4 to 0.8 g/cm.sup.3 and a specific gas permeability of not less than 20 ml/cm.hr.mm Aq., not less than 60% of pores in said electrode substrate having diameter of 10-100.mu., a plurality of elongated holes for feeding reactant gases parallel to said flat surfaces of the electrode substrate and to each other extending from one side of the electrode substrate to an opposite side, the holes being provided substantially at the center of the thickness of said electrode substrate and having a cross section of about 0.2-7 mm.sup.2, and said holes being formed by interposing a polymer sheet material selected from the group consisting of polyethylene, polypropylene, polystyrene, polyvinyl alcohol and polyvinyl chloride as a raw material for forming said holes between said raw materials for said electrode substrate, and calcinating thereof in an inert atmosphere.
2. A carbonaceous electrode substrate according to claim 1, wherein the raw material for said electrode substrate comprises 10-50% by weight of a filler of short carbon fibers and granular active carbon, 10-40% by weight of at least one binder selected from the group consisting of phenol resin, epoxy resin, petroleum pitch and coal pitch and 20-50% by weight of at least one pore regulator selected from the group consisting of polyvinyl alcohol, polyethylene, polypropylene and polyvinyl chloride.
3. A carbonaceous electrode substrate according to claim 1, wherein said holes have circular cross sections of 0.5-3.0 mm in diameter.
4. A carbonaceous electrode substrate according to claim 1, wherein said sheet is in the form of cloth.
5. A carbonaceous electrode substrate according to claim 1, wherein said sheet is in the form of a textile.
6. A carbonaceous electrode substrate according to claim 1, wherein said sheet is in the form of a reed screen-like sheet.
7. A carbonaceous electrode substrate according to claim 1, wherein said sheet is in the form of a lattice.